

Perinatal Outcome Associated with Oligohydramnios in Term Pregnancies

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ABSTRACT

Introduction: Amniotic fluid is a complex substance essential to fetal well-being and dynamic milieu that changes as pregnancy progresses and surrounds developing fetus providing an ideal environment for normal fetal growth and development. Amniotic fluid volume is considered as an important marker of fetal well being which varies with gestational age and depends on a dynamic interaction between placenta, fetus and maternal components.

Methods: This was a hospital based descriptive study conducted at Tribhuvan University Teaching Hospital, from 14th April 2013 to 13th April 2014 (2070 B.S.) which consisted of singleton, term (37-42 weeks) pregnancies admitted with ultrasonographic finding of Amniotic Fluid Index ≤ 5 with delivery within one week of ultrasonographic finding. A prefixed questionnaire was used to fill maternal and fetal outcome parameters like age, parity, period of gestation, Amniotic Fluid Index, associated maternal conditions, mode of delivery, indication of Cesarean section, color of liquor and perinatal outcomes.

Results: Total 115 cases of oligohydramnios were noted accounting for an incidence of 2.4%. 92 women were term, giving incidence of term oligohydramnios to be 2%. Out of 92 cases, 77 (83.6%) underwent emergency caesarean section and 15 (16.3%) were delivered vaginally. Low birth weight of < 2.5 kg was noted in 14 (15.2%) babies and meconium stained liquor was present in 12 (13%) of oligohydramnios cases. APGAR score of < 7 at 1 minute and 5 minute was seen in 13 (14.13%) and 3 (3.26%) cases respectively. Six babies were admitted to Neonatal Intensive Care Unit and one of them expired due to meconium aspiration syndrome. Among 92 cases, 44 (47.8%) were associated with Prelabor Rupture of Membranes followed by post dated pregnancies and Intrauterine Growth Retardation accounting for 12 (13.1%) cases in each group.

Conclusions: Prelabor Rupture of Membranes was the most common cause of term oligohydramnios resulting in high risk of caesarean delivery in oligohydramnios cases. Cesarean Section for oligohydramnios has been associated with good perinatal outcome.

Keywords: Amniotic Fluid Index; oligohydramnios; perinatal outcome.

INTRODUCTION

Amniotic fluid (AF) is a complex substance essential to fetal well-being and dynamic milieu that changes as pregnancy progresses which surrounds developing fetus providing

an ideal environment for normal fetal growth and development.

AFV varies with gestational age and depends on a dynamic interaction between placenta, fetus and maternal components.^{1,2} Abnormally high or low AFV was associated with a significant increase in risk of fetal death, even after a normal contraction stress test (CST) or non stress test (NST).^{3,4} Normal value of AFI is taken as $>5-24$ cm.⁵ An AFI of equal or less than 5 is defined as oligohydramnios.

The incidence of oligohydramnios is 3-5%.⁶ Studies have shown that it can lead to pulmonary hypoplasia, fetal asphyxia,

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structural defects, meconium aspiration, increased cesarean rates and thereby increased neonatal admissions.⁷ Besides oligohydramnios can also be associated with fetal congenital anomalies and growth retardation.⁸

The purpose of this study was to find the incidence of oligohydramnios, perinatal outcome and maternal complications associated with oligohydramnios.

METHODS

This was a hospital based descriptive study. The study was carried out in Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal from 1st Baisakh 2070 (14th April 2014 AD) and completed on 31st Chaitra 2070 (13th April 2014). Patients included in the study were explained about the study and Confidentiality was maintained. Written consent was taken. Ethical approval was taken from IRB before starting the research.

All delivered cases in maternity ward was checked to see if they have USG done within the last 1 week commenting on AFI. Those cases with USG showing AFI was further studied and only those cases which fit inclusion criteria was taken for the study.

Singleton, full term (37-42) pregnancy admitted with USG finding of AFI ≤ 5 cm with delivery within one week of USG finding were included in the study. The patient with following findings were excluded from the study:

- Multiple pregnancies
- Intrauterine Fetal Demise
- Anomalous fetus
- USG not done in TUTH

Collection of data was done through interview and review of previous USG findings done in antenatal period. A fixed questionnaire was used to fill up various maternal parameters like age, parity, gestational age, associated medical and obstetric complications and mode of delivery.

Fetal outcome like weight, Apgar score at 1 and 5 minutes, colour of liquor were noted.

The patients and newborn were followed up till discharge and neonatal complications like NICU admission and mortality were noted.

Data were entered in the SPSS program package and analysis was done through the same program.

RESULTS

The total number of deliveries during the study period was 4728. Among them, there were 115 (2.4%) oligohydramnios. Out of these, 92 (2%) were term oligohydramnios and 92 cases were analyzed.

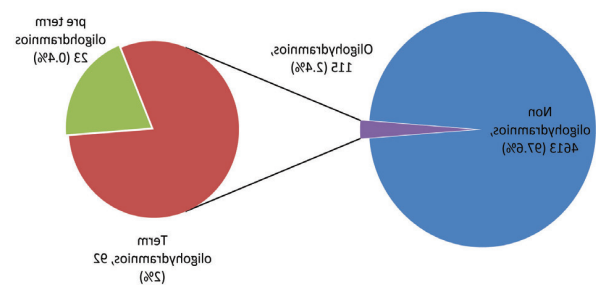


Figure 1. Incidence of Oligohydramnios.

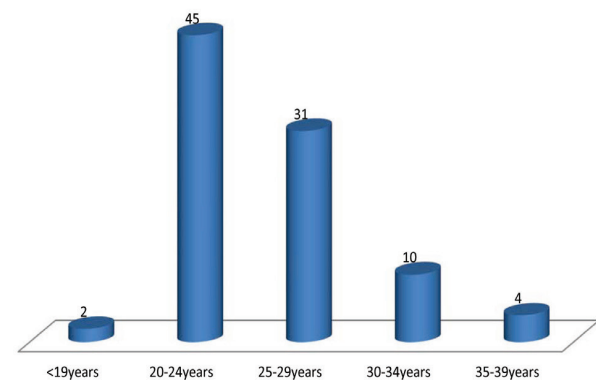


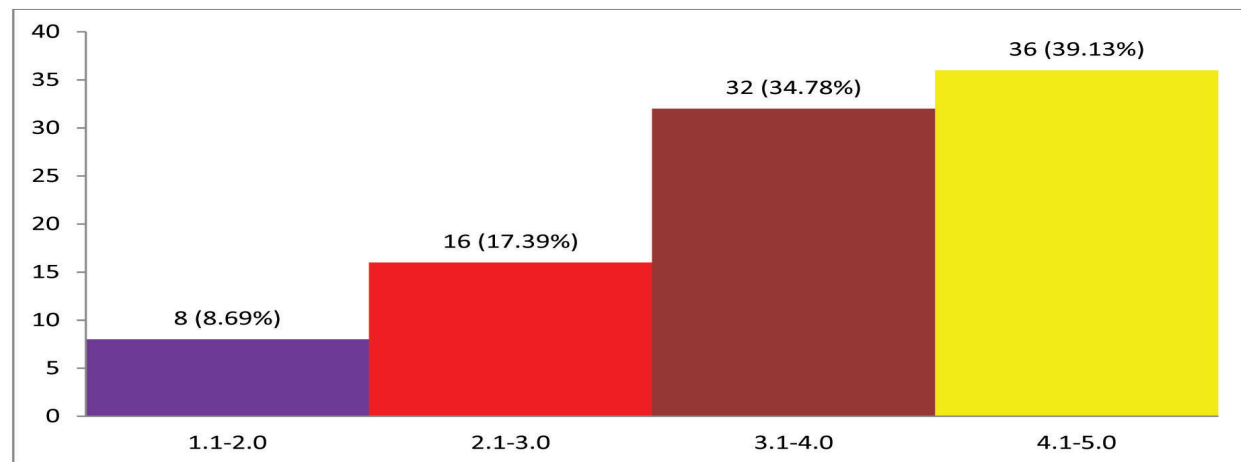
Figure 2. Age distribution of Oligohydramnios.

The age of the women ranged from 18-39 years with the mean age being 25.43 ± 4.11 years. Maximum number of patients was 31 (82.6%) between 20-29 years.

Table 1. Distribution of gravid and booking status.

	n (%)
1	62 (67.4)
2	20 (21.7)
3	5 (5.4)
4	3 (3.3)
5	1 (1.1)
6	1 (1.1)
Total	92 (100)
Booked	83
Unbooked	8
Referred	1
Total	92

Majority of women were primigravida 62 (67%) and 90% were booked cases of our hospital.

**Figure 3. Amniotic fluid index.**

The AFI ranged from 1.1 to 5 and the mean AFI was 3.6 ± 1.01 . Majority of women 36 (39.13%) had AFI of 4.1-5.0.

Table 2. Mode of Delivery.

Type of delivery		AFI				Total
0-1.0		1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0	
Vaginal	Spontaneous vaginal	0	0	2	4	3
	Induced vaginal	0	0	0	3	3
CaesareanSection	Emergency caesarean section	0	8	14	25	30
Total		0	8	16	32	36

Most of the women i.e. 77 (83.7%) had delivery by Cesarean section and all of them were emergency Caesarean section. Caesarean section rate in AFI less than 3 was 91% where as in

that of AFI more than 3 were 80 %.

Of total, 15 (16%) were vaginal deliveries. Among them 9 (60%) delivered by vaginal route whereas labor was induced in 6 (40%).

The chance of meconium staining of liquor was 2.6 times higher in women reaching 40 weeks and beyond in comparison to women

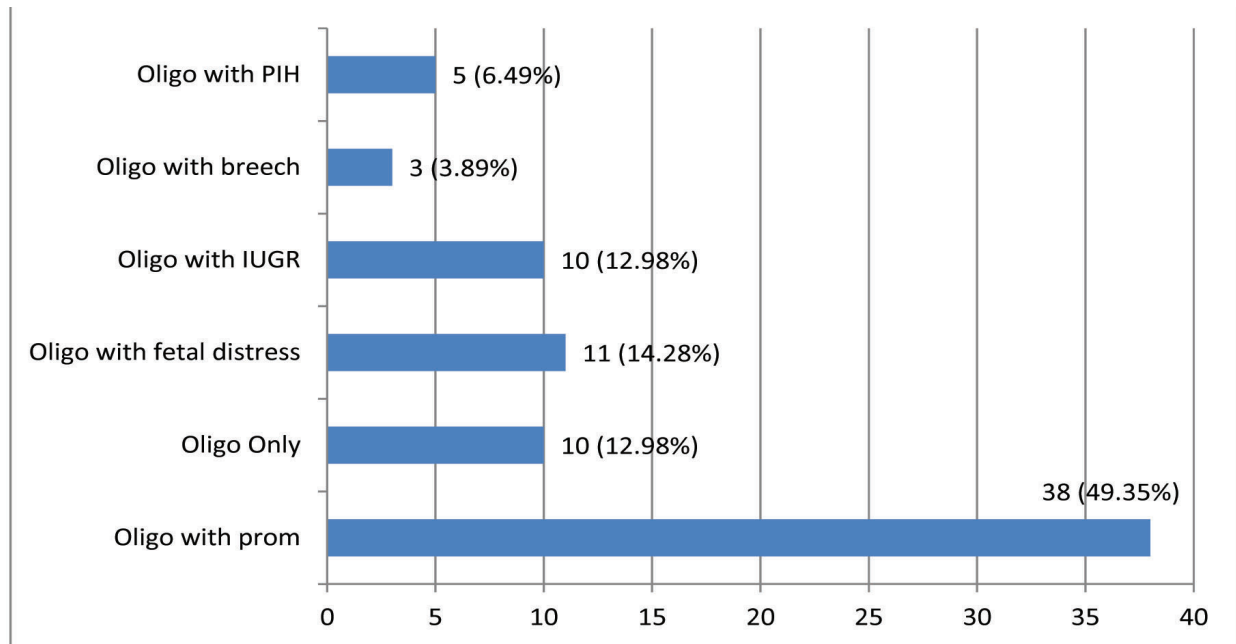


Figure 4. Indications of Caesarean section.

Oligohydramnios due to PROM was the commonest indication of LSCS with least common indication being associated malpresentation.

Table 3. Association of AFI with mode of delivery.

AFI in cm	Mode of delivery		Odd's Ratio	P
	Caesarean section	Vaginal delivery		
≤3	22	2	2.6	0.36
3-5	55	13		

There is 2.6 times increased risk of caesarean section in AFI≤3 cm in comparison to AFI 3-5cm. However, it is not statistically significant.

Colour of liquor was clear in 80 (87%) of deliveries with meconium stained in 12 (13%). Mild and moderate meconium stained liquor were noted in 3 and 2 cases respectively. There were 7 cases of thick meconium stained liquor.

less than 40 weeks period of gestation.

Table 4. Distribution of AFI with weight of newborn.

	AFI					Total n (%)
	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0	5.1-6.0	
Weight	1.5-	2	2	5	5	14 (15.2%)
	< 2.5 kg					
	2.5-	6	14	26	31	77 (83.6%)
	4.0kg					
	More than 4kg	0	0	1	0	1 (1.08%)
Total		8	16	32	36	92 (100%)

Birth weight of babies ranged from 1.5 kg to 4.5 kg. The mean birth weight was 2.76 kg with SD of 0.4 kg. Among them 15% of babies was growth restricted. Mean APGAR score at 1 minute and 5 minute was 6.79 ± 0.65 and 7.8 ± 0.49 respectively. There is 2.9 times risk

of having APGAR score of < 7 at 1 minute in AFI ≤ 3 cm group in comparison to AFI 3.1-5cm. PROM was the most common condition associated with oligohydramnios followed by post dated pregnancy and IUGR. However there was no case of congenital anomalies in this study.

DISCUSSION

Amniotic fluid volume serves as an indicator of fetal well being as amniotic fluid volume highly influences the fetal outcome. So, the evaluation of amniotic fluid volume has become an integral component of fetoplacental assessment and surveillance of pregnancies that are considered to be at risk of adverse pregnancy outcome. As a result, the adoption of antenatal ultrasound has led to the increase in diagnosis of oligohydramnios. The incidence of oligohydramnios is reported to be 3-5% in third trimester.⁶ In another study done by Jun Zhang et al⁹ in 15,151 low risk women, the incidence of oligohydramnios was 1.5%. Thus, the risk of LSCS is higher in oligohydramnios. There is increased chance of LSCS for failed induction or fetal heart rate irregularities despite trying vaginal delivery. The chance of vaginal delivery is increased if the patient is already in labour. In the study done by Casey et al¹⁰ meconium stained liquor was found only in 6% which is much lower than our study. This could be because his study included women with oligohydramnios from 34 weeks of gestation onward.

However, there was no difference between the groups (AFI <5 cm versus AFI > 5 cm) with regard to meconium-stained amniotic fluid in the study of Voxman et al.¹¹ This could be due to the inclusion of non-stress test (NST) in the study in addition to AFI which helped in early detection of compromised fetus. If the NST was nonreactive, it was followed by biophysical profile and if it was abnormal, intervention was based on further evaluation.

Most studies show that oligohydramnios has high chance of being associated with low APGAR. In this study the mean APGAR score at 1 minute and 5 minute were 6.79 ± 0.65 and 7.8 ± 0.49 respectively, with 13 babies (14.1%) having APGAR score < 7 at 1 minute and 3 (3.26%) having an APGAR score < 7 at 5 minute. The slightly better

outcome may be due to the offering of LSCS to the patient in most cases with AFI <5 and the study sample being term pregnancy. Besides, those cases with abnormal CTG would go for LSCS thus reducing chances of delivering an asphyxiated baby.

Locatelli and colleagues included pregnancies between 40.0 and 41.6 weeks and most of them were delivered by Caesarean section.¹² Similarly, Alchalabi and his friends analysed term pregnancies (37-42 weeks) with and without oligohydramnios admitted for induction.

Study by Nalizma et al¹³ noted APGAR score < 7 at 5 minute in 26.9% babies with less AFI. Inclusion of women after 28 weeks gestation may be the reason for such high percentage of babies with low APGAR score.

Cristina Rossi et al¹⁴ in their meta-analysis found the incidence of neonates with birth weight < 10 th percentile was higher among oligohydramnios but the result was the statistically significant.

Similar study by Locatelli et al¹² found neonates with birth weight < 10 th percentile (13.2% vs. 5.5%, $P < 0.001$) were significantly higher in the AFI ≤ 5 cm compared to AFI > 5 cm. High rate of IUGR in both of these studies could be due to the inclusion of high risk pregnancies which in itself is a risk factor for oligohydramnios.

Umber et al¹⁵ demonstrated that oligohydramnios was associated with increased risk of admission to NICU (7% Vs 1.7%). Incidence of NICU admission was also consistent with studies done by Magann et al and Casey et al¹⁰ which were 7.6% and 7% respectively.

Studies by Bangalet al⁸ and Casey et al¹⁰ the perinatal mortality was 24% and 5% respectively. Bangal in his study noted that 11 out of 12 cases of mortality were in the unbooked cases.

The reason behind this was to identify the oligohydramnios cases so that early intervention could be taken especially if severely oligohydramnios and vaginal delivery could be allowed if the liquor was still adequate. About 80.3% cases were found to have decreased liquor in our study who

underwent caesarean delivery.

This should be done with vigilant monitoring and if any sign of fetal compromise or labor abnormalities develop, prompt delivery by caesarean section should be considered for improving the neonatal outcome.

CONCLUSIONS

The incidence of oligohydramnios was 2.4%. LSCS was the most common mode of delivery. Out of those who underwent vaginal trial, 78.9% delivered vaginally. The most common condition associated with oligohydramnios was PROM. Low birth weight was noted in 15% women with oligohydramnios. The immediate intervention with emergency LSCS for term oligohydramnios cases has been found to be associated with good perinatal outcome as evident by the low neonatal admission and very low mortality in this study.

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CONFLICT OF INTEREST: None.

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